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ABSTRACT

This study examined the proportion of time children in the Kamehameha Early Education Program schools spend at actual school work in learning centers. Systematic time-sampled observations using multiple observers were conducted in December-January and again in March-April. The subjects, 12 children (6 kindergarteners and 6 first graders) were observed two times each in the two time periods by five staff members. Observations were coded for two mutually exclusive behavioral categories of pupil activity: on-task (work appropriate behavior) and not on-task (behavior not appropriate for the situation, and play behavior following completion of work). Results indicated that children spent proportionately less time working (on-task behavior) than on non-work activities (not on-task behavior). (CM)

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Technical Report #17

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The Kamehameha Early Education Program

The Kamehameha Early Education Program (KEEP) is a research and development program of The Kamehameha Schools/Bernice P. Bishop Estate. The mission of KEEP is the development, demonstration, and dissemination of methods for improving the education of Hawaiian and Part-Hawaiian children. These activities are conducted at the Ka Na'i Pono Research and Demonstration School, and in public classrooms in cooperation with the State Department of Education. KEEP projects and activities involve many aspects of the educational process, including teacher training, curriculum development, and child motivation, language, and cognition. More detailed descriptions of KEEP's history and operations are presented in Technical Reports #1-4.

Abstract

What proportion of time do KEEP children spend at actual school work in well-managed learning-centers? Informal observation suggested that the proportion was in favor of play, chatting, and nonwork related activities. Are learning-centers inherently inefficient in organizing child learning? Systematic time-sampled observations, using multiple observers (with reliability established), were conducted in December-January and again in March-April. Percent of time actually on-task averaged about 25 percent.

These results were found in well-managed learning centers, where children were well-disciplined in the procedures of moving from one center to another. Future research must explore alternate classroom organizations to determine whether on-task percent and actual learning can be improved.

Technical Report #17

A Study of Time Spent Working at Learning Centers

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The use of learning-centers, or groups of children working at small tables, is prevalent in most present elementary school programs. It has generally replaced traditional classroom settings of rows of individual tables. At the KEEP Demonstration School, an arrangement of small groups of five or six children working around a table is the core of the majority of the academic activities. How learning-centers came into being and why individual desks were discarded is difficult to determine precisely. The move from traditional group instruction to individualized curricula has certainly assisted in maintaining the learning-center atmosphere. Along with this change, the concern for creativity in children and the need for developing self-concept evolved; both were difficult to develop when a class of children was viewed and treated as a unit by the teacher. The change from teaching "only facts" to teaching "reasoning" made it necessary to provide places where small groups of children could work together. There was a greater need for activity areas for application of facts and knowledge, as well as a need for small groups of children to meet and interpret, analyze, evaluate, generalize, and synthesize knowledge. In any case, learning-center oriented classrooms are pleasant to observe insofar as contemporary philosophical and aethetic values are concerned. Whether a learning-center or a traditional setting is superior in facilitating academic achievement is a question not often addressed.

KEEP Learning-Centers

In the first grade language-arts/reading time block, the children were heterogeneously divided into five groups of six children, and moved from one center to the next while remaining in these groups. Each center had a box containing color-coded folders in which the teacher placed the appropriate work pages for each child. The child progressed as slowly or rapidly as he or she was able at each center. School work was corrected, recorded, and sent home daily.

Center One had paper work and activities related to visual discrimination skills. Center Two was set up as a peer-tutoring center, with each child having a turn at being a tutor, then a tutee. Center Three was the listening skills center, where a child had a headset to hear the instructions for the assignment. Center Four was the writing skills center, where each child dictated a "story" to the teacher who would then print it as a "master" for the child to copy. Center Five was the story-music center. Depending on the activity going on in library or music class, the children listened to a current interest on headsets.

The centers were prepared and monitored by one teacher, while another teacher would take reading groups out for their lessons in reading.

Five different activity centers were set up in the kindergarten classroom. The Dubnoff materials used at Center One were designed to shape writing behaviors, with much practice in tracing lines and circles presented in different ways. At Center Two, the children learned color names and words. Center Three had sheets for the children's "alphabet trains" which they built up one car and one letter at a time. They practiced writing a single letter and pasted their finished writing samples on construction paper. Center Four contained materials for

developing discrimination and classification skills; the children classified objects and colored and pasted like ones together. At Center Five, they played lotto games which required them to match like or related pictures on cards.

Halfway through the first semester, two new centers were added and Center Five changed from a games center to a writing center in which the children copied letters and short phrases with the aid of a model on the bulletin board. The new centers were Center Six, where the children listened to tapes coordinated with exercise sheets to train auditory memory, and Center Seven, a tutoring center, where they used specially designed stacks of cards to learn upper and lower case letter names and numbers from one to 30. At this time, the class was divided into two groups, with one group of eight children going to Centers One through Five, while the rest of the class went to Centers Three through Seven.

After completing work at one center, the children were able to choose from a number of play activities. Those available at different times included the doll corner, painting, clay, drawing, blocks, books, and tinkertoys.

During the second semester in January, the two classes, kindergarten and first grade, were combined. The children were tested and ability-grouped. These groups of children (ranging in age from six to seven) were numbered one through six, and these groups constituted a self-contained center. The two Reading teachers, then, were in charge of three groups each, which they took, one at a time, into the Reading room for 20-minute lessons. While two groups of children were at reading, another teacher monitored the rest of the groups at their work centers. The children were still given work in visual discrimination, writing, and listening. When the work was completed, the teacher would correct it immediately, and make a star beside the child's name on the group's chart. Children who were finished with their daily center assignments, were allowed to play with various toys and games.

All the KEEP staff began the school year enthusiastically committed to the learning-center organization. The details of our learning-center program, as presented, have been drawn heavily from our observations of the best and most progressive DOE classrooms.

It is our policy, however, to examine carefully even our own enthusiasms. Our staff, including the learning-center teachers themselves, were uneasy over the relative amount of actual work-time which the learning-centers seemed to produce. An enormous amount of time is required for the children to be assigned tasks, find their tables, assemble materials, etc. The relatively unproctored environment makes informal socialization among children a tempting alternative to working. Even after a group of children have been well-trained in learning-center procedures, and they have learned that the teacher expects diligence, the level of children's work efficiency cannot be raised beyond a point because of the structural aspects of learning-centers.

Is that maximum level of efficiency still unacceptably low? In well-managed learning-centers, does enough work actually occur to justify their use? To answer these questions, it is necessary to know exactly how much time children spend working.

Method

Subjects

12 children (six kindergarteners and six first graders at KEEP) were selected for the sample. Teachers' rankings of these children's reading levels were used to select two high, two medium, and two low level ranks from each class.

Observers

A total of five observers were used, all of whom were KEEP staff members

Four observers were used during the first observation series in December-January; three were used during the second observation series in March-April.

The Coding System

The coding system consisted of two mutually exclusive behavioral categories for pupil activity in the classroom.[1] These categories and their definitions are as follows:

1. On-task: A very stringent on-task measure was used. A pupil was considered on-task if his or her behavior was appropriate to the work situation. A child was on-task, for example, if he was quietly attending to his learning-center work while at his seat, listening to instructions related to work, communicating to a peer about the assigned task, seemingly engaged in some form of peer tutoring (pointing to lesson paper and instructing another child), reaching for work materials such as paper, paste, etc., at his table.

On-task excluded appropriate play behavior following completion and checking of child's assigned task, obtaining of materials if it meant the child's getting up and walking to materials, attending to the teacher while she was not actually giving academic input (examples of the latter category include teacher giving management instructions, or instructions as to where to obtain materials for the lesson), and waiting for a teacher to check work.

2. Not on-task: Pupil behavior deemed inappropriate to the situation, but also including appropriate play behavior following completion and checking of work. Although classroom rules allowed a child to play games or to read a book following completion of an assigned task, we designated all such activities to be nonwork and, therefore, not on-task. Examples of not on-task include daydreaming, being disruptive (pushing, shouting, fighting, running into others, etc.), playing with games, reading a book, being between tasks (obtaining work materials not at pupil's desk, waiting for teacher with or without raised hand, standing in line, talking to other children about nonwork related subjects, etc.). It should

[1]An initial attempt to obtain reliability on four mutually exclusive categories (on-task, off-task, between-task, and disruptive) failed. Due to this initial difficulty with attaining reliability, only the on-task and not on-task were retained.

be noted that judgment of content of a child's communications to other pupils was largely intuitive. Observers derived information from other behavioral cues (child pointing to lesson paper, child not laughing while speaking to another child). Using these, and other cues, observers made a judgment as to whether child was speaking to another about work-related or nonwork-related matters.

Observation Procedures

Observations were scheduled during learning-center periods every morning, excluding a 30-minute recess period. Thus, observation periods ran approximately 130-140 minutes. December-January observations ran from 8:20 a.m. to 9:20 a.m. and again from 9:50 a.m. to 11:00 a.m. In March-April, observations ran from 8:20 a.m. to 9:50 a.m. and from 10:20 a.m. to 11:00 a.m. The slight change in observation schedule for March-April resulted from changes in learning-center format. Observations were merely rescheduled to coincide with changes in the learning-centers.

Observation began after school started, that is, after lunch money had been collected and morning recital exercises had been completed (pledge of allegiance, singing of songs, etc.). Observation ended when a child went out the door to recess or when the learning-center period was over, as evidenced by the child being excused to walk over to the next teacher's group.

Observation procedures differed somewhat from initial sessions in December-January to final observation sessions in March-April. During December-January sessions, observers were paired for data collection, one being responsible for clocking on-task behaviors, the other being responsible for clocking not on-task behaviors, for the same child. Each observer was equipped with a stopwatch and code sheet. At the precise moment Observer A stopped recording on-task behaviors, Observer B began recording not on-task behaviors. In this manner, there was continuous recording of data throughout the learning-center period. The one exception made was time spent at the listening center, from which data were not collected.

During the second series of observations in March-April, observers recorded alone, rather than in pairs. Each observer was equipped with two stopwatches and a code sheet. One stopwatch was used to collect on-task data, the other stopwatch was used to collect not on-task data. A continuous recording system still remained in effect; observers still continued to collect totals of on-task and not on-task behavior.

In March-April children were daily grouped for reading sessions. During these instances, if the observed child was selected for reading group, coding was discontinued.

The 12 selected children were observed a total of two times each, once in the December-January period and once in the March-April period. A total of 24 observations were thus obtained.

Reliability

To establish reliability, a "photographic" time-sampling at 10-second intervals for two consecutive minutes was used. Reliability coefficients were established between observers in December and again in March. Each observer was compared against the other observers. Reliability coefficients of the last three December observation trials are shown below:

December Reliabilities

Observer	First Observation	Second Observation	Third Observation
A and B	87.5	89.6	97.2
A and C	93.8	97.9	100.0
A and D	89.6	93.8	91.6
D and B	89.6	87.5	88.8
D and C	95.8	95.8	91.6
C and B	95.8	87.5	97.2

Prior to a second series of observations in March, reliability coefficients were again obtained. Only three observers were available, and eventually, one of the three dropped out due to a heavy work schedule, leaving two observers to complete the second series of 12 observations.

The method of obtaining March reliability coefficients was the same as that established in December.

March Reliabilities

March Reliability	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Trial 6
A and B	100%	100 %	91 %	91%	-	-
B and E	91%	91%	66%	100%	100%	80%

Observers B and E practiced longer (six final trials) to ensure accurate reliability, particularly as Observer E had not previously collected data during the December-January sessions.

Results

Table 1 summarizes the observation data in the form of percentage of on-task behavior for all kindergarten and all first grade children per first and second observation periods.

Table 1

Percent On-Task, First Graders and Kindergarteners

	First Graders						Kindergarteners					
Reading Ability Level	Hi	Hi	Med	Med	Lo	Lo	Hi	Hi	Med	Med	Lo	Lo
Subject Number	1	2	3	4	5	6	7	8	9	10	11	12
First Observation	25	25	42	18	26	14	26	20	10	31	21	18
Second Observation	26	25	36	35	21	15	42	38	6	33	9	21

Mean on-task percentages for each class of children per December or March observation periods are shown below in Table 2.

Table 2

Mean On-Task Percent Each Class of Children

December Observation Grade 1	March Observation Grade 1
25.33	20.93
December Observation Kindergarten	March Observation Kindergarten
26.33	24.83

Average percent on-task of each class declined between December and March. However, a statistical comparison of December on-task against March-April on-task percentages reveals that changes in percentages for all children are not statistically significant (t=.8507, df=11, $p > .02$).

A comparison among first graders only for December and March on-task scores, likewise, reveals no statistical significance (t=.2958, df=5, $p > .5$). Figures seem to indicate that on-task behaviors of the selected children did not significantly increase or decrease as the year progressed, even with the change in learning-center format.

To summarize, initial impressions that children spent proportionately less time working (on-task behaviors) than on nonwork activities (not on-task behaviors) were confirmed through the systematic classroom observations.

Discussion

It is important to realize that this study observed children in

well-functioning centers. We did not begin observations until completion of the long training period required to teach children the mechanics of the system. The teachers were experienced, and committed to the philosophy and the system. Educationists who visited the program, our own consultants, and our own supervisors were uniform in their view that the centers were crisply organized, and the students were well-socialized to them. It is our view that these data describe the best of learning-centers, not a poor example.

Why, then, is the work level at only 25 percent? For each child, the answer may be different. For example, the best readers often finished their work and spent time with the play-time reward. The poorer readers were more inclined to be idle when the teacher was not near their table. The major reason, however, was clearly that the necessary time for organizing, moving from one place to another, checking work, etc., was discouragingly long. The data indicate that learning-centers, for all their merits, are not efficient with children's time.

Whether they are, in fact, less efficient than any other form of classroom organization is not known. Future research must investigate this problem.

Implications for Future Research

What were the children doing instead of working? The overwhelming impression is that they were talking to each other about recess events, someone's new shoes--just chatting and gossiping. The high sociability of these children is well-known; their preferred response is talking and interacting with one another and the learning-center structure facilitates this response. Would some other organization, which makes interaction more difficult, increase work efficiency? More important, would it improve or interfere with actual learning?

To address these problems, a study comparing a learning-center setting with one in which each child was isolated was conducted and reported in Technical Report #18.